

1812004/1050865

US030166

REC'D 16 AUG 2004

WIPO

PCT

PA 1182617

# THE UNITED STATES OF AMERICA

**TO ALL TO WHOM THESE PRESENTS SHALL COME:**

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

June 16, 2004

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: 60/477,200 ✓

FILING DATE: June 10, 2003 ✓

PRIORITY DOCUMENT  
SUBMITTED OR TRANSMITTED IN  
COMPLIANCE WITH  
RULE 17.1(a) OR (b)

By Authority of the  
COMMISSIONER OF PATENTS AND TRADEMARKS



*L. Edele*

L. EDELEN  
Certifying Officer

BEST AVAILABLE COPY

14202 U.S. PAT. & T. OFF.  
6/10/90

06-11-03

603477200 A/6/90  
\$

**PROVISIONAL APPLICATION COVER SHEET**

This is a request for filing a **PROVISIONAL APPLICATION** under 37 CFR 1.53(b)(2).

Docket Number <b>US030166</b>		Type a plus sign (+) inside this box <input type="checkbox"/>	+ 17612 U.S. PAT. & T. OFF. 6/10/90
INVENTOR(s) / APPLICANT(s)			
LAST NAME <b>BIRRU</b>	FIRST NAME <b>DAGNACHEW</b>	MIDDLE INITIAL	RESIDENCE (CITY AND EITHER STATE OR FOREIGN COUNTRY) <b>BRIARCLIFF MANOR, NEW YORK</b>
TITLE OF THE INVENTION (280 characters max) <b>8-VSB LIKE BACKWARDS-COMPATIBLE ROBUST STREAM MODULATION FOR ATSC DIGITAL TV</b>			
CORRESPONDENCE ADDRESS Corporate Patent Counsel U.S. Philips Corporation P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510			
STATE <b>New York</b>	ZIP CODE <b>10591</b>	COUNTRY <b>U.S.A.</b>	
ENCLOSED APPLICATION PARTS (check all that apply)			
<input checked="" type="checkbox"/> Specification	Number of Pages <b>2</b>	<input type="checkbox"/> Small Entity Statement	
<input type="checkbox"/> Drawing(s)	Number of Sheets <b>1</b>	<input type="checkbox"/> Other (specify)	
METHOD OF PAYMENT (check one)			
<input type="checkbox"/> A check or money order is enclosed to cover the Provisional filing fees		PROVISIONAL FILING FEE AMOUNT (\$)	<b>\$160.00</b>
<input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge filing fees and credit Deposit Account Number: <b>14-1270</b>			

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

No

Yes, the name of the U.S. Government agency and the Government contract number are:

Respectfully submitted,

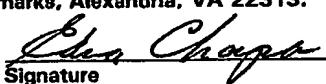
SIGNATURE: 

Date: 6/10/03

TYPED or PRINTED NAME: STEVEN R. BIREN

REGISTRATION NO.: 26,531

Additional inventors are being named on separately numbered sheets attached hereto

<u><b>CERTIFICATE OF EXPRESS MAILING</b></u>	
Express Mail Mailing Label No <u>EV 335816662</u>	
Date of Deposit <u>June 10, 2003</u>	
I hereby certify that this paper and/or fee is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 C.F.R. 1.10 on the date indicated above and is addressed to the Commissioner of Patents and Trademarks, Alexandria, VA 22313.	
<u>EDNA CHAPA</u> Typed Name	

## INVENTION DISCLOSURE (continued)

### 8-VSB like backwards-compatible robust stream modulation for ATSC digital TV transmission

There have recently been a growing interest to modify the ATSC digital TV standard in a backwards compatible manner such that broadcasters will be able to broadcast signal that has different degree of robustness together with the existing signal. The key to achieve robustness in a backwards compatible manner lies on the signal processing of the error correction part of the transmitter. A top level diagram of the mixing a robust stream with the standard stream is shown in figure 1.

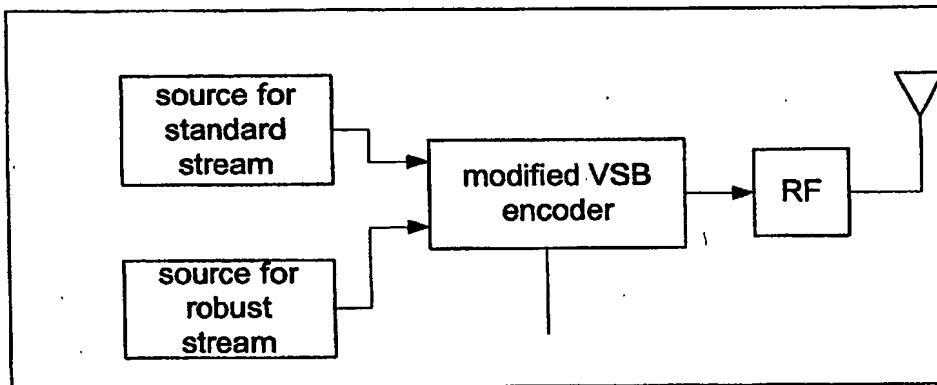


Figure 1: Top-level diagram of mixing a standard stream with a robust stream

The 8-VSB (ATSC) standard uses signals mapped to one of the 8-levels (-7,-5,-3,-1,1,3,5,7). This is called equiprobable 8-VSB signal. One of the approaches to encode a robust stream is to reduce the alphabet size from 8 level to 4 level. For example, possibilities exist to use {-7,-5,5,7}, or {-7,-1,3,5}, or {-5,-3,1,7}, etc.

When the alphabet size is reduced from 8 to 4, then the performance of the system will improve. One of the disadvantages of such systems is that they can potentially have backwards compatibility problem. Old receivers that are designed based on the 8 level statistics may show some potential degradation. The alternative approach proposed here is to use multiple modulation types in a single stream in such a way that the statistics of the output signal will look like the standard 8-VSB signal. For example, if the set of constellation points {-7,-1,3,5}, or {-5,-3,1,7}, are randomly selected to modulate each symbol of the robust stream, the average signal will look like 8-VSB. Figure 2 shows the constellation diagrams.

## INVENTION DISCLOSURE (continued)

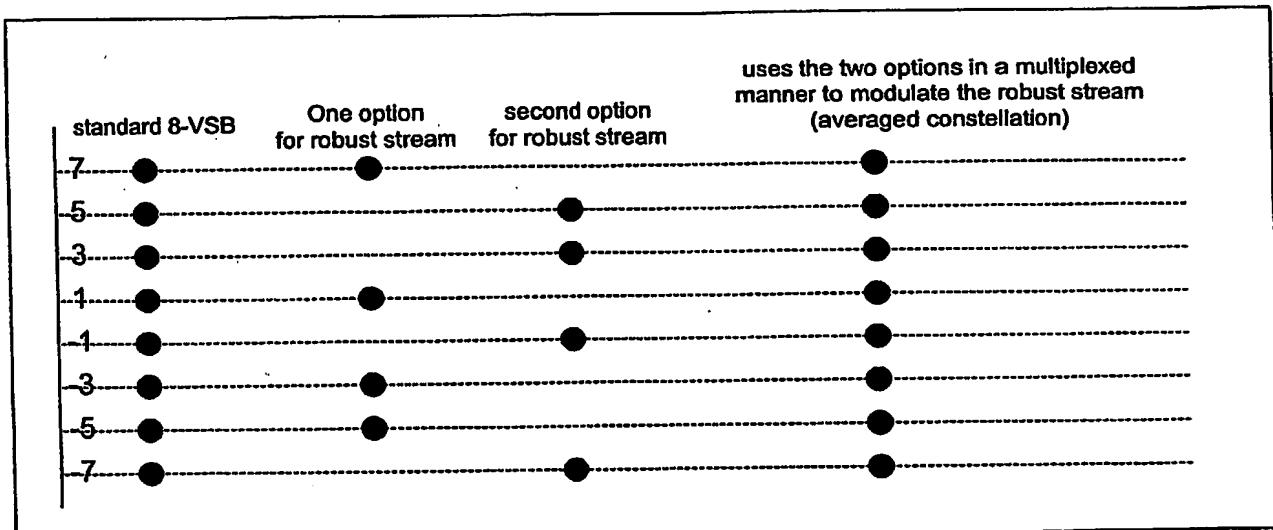


Figure 2: constellation diagrams

The constellations are achieved by manipulating the input of the trellis encoder of the standard 8-VSB system as shown in Fig 3. For a given robust stream symbol, the control sequence generator instructs the pre-processor to generate the appropriate bits such that when these bits are input to the standard trellis encoder, the output of this trellis encoder is forced to be one of the desired constellation points. For brevity reasons, the details of this operation are omitted since the exact implementation of the details can vary.

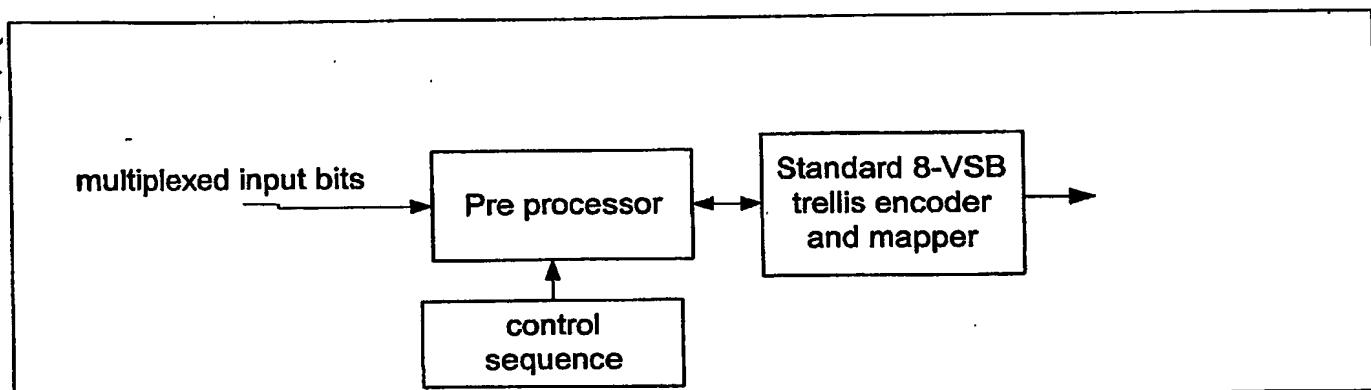


Figure 3: Simplified top-level diagram of the last stage of a modified ATSC VSB encoder

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Atty. Docket

DAGNACHEW BIRRU

US 030

Serial No.

Filed: CONCURRENTLY

Title: 8-VSB LIKE BACKWARDS-COMPATIBLE ROBUST STREAM MODULATION FOR  
ATSC DIGITAL TV

Commissioner for Patents  
Alexandria, VA 22313

APPOINTMENT OF ASSOCIATES

Sir:

The undersigned Attorney of Record hereby revokes all  
prior appointments (if any) of Associate Attorney(s) or Agent(s) in  
the above-captioned case and appoints:

STEVEN R. BIREN

(Registration No. 26,531)

c/o PHILIPS ELECTRONICS NORTH AMERICA CORPORATION, Corporate  
Intellectual Property, 580 White Plains Road, Tarrytown, New York  
10591, his Associate Attorney(s)/Agent(s) with all the usual powers  
to prosecute the above-identified application and any division or  
continuation thereof, to make alterations and amendments therein,  
and to transact all business in the Patent and Trademark Office  
connected therewith.

ALL CORRESPONDENCE CONCERNING THIS APPLICATION AND THE  
LETTERS PATENT WHEN GRANTED SHOULD BE ADDRESSED TO THE UNDERSIGNED  
ATTORNEY OF RECORD.

Respectfully,

  
Michael E. Marion Reg. No. 22,266  
Attorney of Record

Dated at Tarrytown, New York  
on June 9, 2003.